



The Maize ASTI System

Lessons from a National ASTI Case Study In Malawi

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BACKGROUND

- **PART OF A SERIES OF CASE STUDIES UNDERTAKEN IN AFRICA IN CONJUNCTION WITH CTA ON APPLICATION OF THE AGRICULTURAL SCIENCE, TECHNOLOGY AND INNOVATION (ASTI) SYSTEM IN AFRICA**

Case Study Objectives

- **To build capacity in the ACP to better understand the strengths and weaknesses of the local science, technology and innovation system in the agricultural sector.**

Methodology

- 1. Sensitisation workshop of stakeholders on the ASTI System**
- 2. Reviewing the Policy Environment –desk study**
- 3. Identifying or Mapping of Key Actors in the ASTI System –structured-questionnaire interviews**
- 4. Stakeholder Consultative Workshops (in 4 major maize producing areas)**
- 5. Scan research related to maize in Malawi based on identified topics**
- 6. National Stakeholder Seminar**

The Research Team

- **Multidisciplinary in Nature**
- **Case Study and Stakeholder Meetings Coordinator: Safalaoh, A**
- **Mapping out Actors: Safalaoh, A and Dr. J. Bokosi (Plant Breeder)**
- **Policy Analysis: Dr. J. Bokosi and Thabbie Chilongo, Research fellow – Agricultural Policy Unit**
- **Scanning Research in Maize: Dr. V.Kabambe and Ms Wezzie Mhango, Crop Scientists**
- **Overall Coordination College level: Dr E. Kaunda and Prof. J. Banda**

Case Study

Limitations/Challenges

- **Evident lack of conceptualization and understanding of the ASTI system or approach by actors**
- **Difficulty to source documents – e.g. policy docs**
- **Survey:**
 - **No perceived benefit from study by actors –mainly from private sector**
 - **Reluctance to release some information by actors (Lack of trust/suspicion)**
 - **Long questionnaire/time consuming**

CASE STUDY RESULTS

The Maize Sector

- Maize is the staple food crop in Malawi
- **National Requirement 2005/06: 2.18 million tonnes**
- **Production 2005/06: ~2.6 million tonnes**
- Production 2004/05: 1.25 million tonnes
- Surplus attributed to good rains and availability of subsidised inputs – fertiliser : from ~\$22 to \$7

Maize Production for '05-06 and 06-07 Seasons

Maize Type	Hectares 2006-07	Yield, Metric Tonnes	Hectares 2005-06	Yield, Metric Tonnes
Local	576,049	536,023	659,521	577,673
Composite	597,294	1,175,048	554,583	994,670
Hybrid	508538	1,435,327	406,069	1,027,366
Total	1,681,881	3,146,398	1,620,173	2,599,709
% of total cereals	90.6	94.0	90.7	94.5

**POLICIES (plans/strategies)
WITH A BEARING ON THE
MAIZE SUBSECTOR**

General Agric Policy

- **Dualism policy adopted soon after independence: Estate vs Smallholder sector**
- **Statement of Development Policies (DEVPOL): 1977-1986 and 1987-1996**
- **In 1995: Agricultural and Livestock Strategy and Action Plan (ALDSAP)**

Agric. Policy (cont'd)

- **Policy guided by other general strategies:**
 - **Vision 2020**
 - **Malawi Growth and Development Strategy (MGDS)**
 - **Millennium Development Goals, etc.**

Input Policy

- **Establishment of structures for marketing of inputs and produce by (smallholder) farmers**
 - **Up to 1980s: Agricultural Development and Marketing Corporation (ADMARC): source of inputs at subsidized prices for smallholder farmers**
 - **1988: the Smallholder Farmer Fertilizer Revolving Fund of Malawi (SFFRFM)**
 - **Malawi Rural Finance Company (MRFC) >> provides loans**

Input Policy cont'd)

- **1997/98: Agricultural Productivity Investment Programme (APIP): provision of credit to procure seeds (hybrid maize and legumes) and fertilizer.**
- **Targeted Input Programme**
- **2005/06: Fertiliser 'Targeted' Subsidy**
- **Seed Policy: promotion of private sector participation in the industry.**
 - **Strategies:**
 - **1997/98-99: Small-Scale Seed Development Programme and the Large-Scale Certified Seed Production Programme.**

Marketing Liberalisation

- **Free to buy and sell policy**
- **Recently Malawi Agriculture Commodity Exchange: provides market information**

Other Policies

- **Land Policy**
 - **Land Reform Commission established in 1996 >>> new land policy**
 - **Currently, landless people being relocated/assisted to buy land**
- **Irrigation Policy**
- **S and T policy adopted in 1991, revised 1997**
- **Draft Policy, 1998, Adopted 2001**
- **Goal: to attain sustainable socio-economic development through the development and application of science and technology in order to improve the standard and quality of life of Malawians**

National Biotechnology Policy

- **Inception: May 25, 2005.**
- **Objective: ‘to regulate the use, importation, export and research on biotechnology’ e.g. use of GMO maize!!!**



**MAPPING OUT KEY ACTORS
IN THE MAIZE SUBSECTOR IN
MALAWI**

Selected Actors In The Maize ASTI System/Sub-sector in Malawi

– **Government:**

- Policy issues, Extension and Diffusion, Research, Funding, marketing and trade, Quality Control.

– **Entrepreneurs: Farmers/Producers**

– **NGOs: Diffusion/adoptin of technologies; financing –Sasakawa Global 2000....**

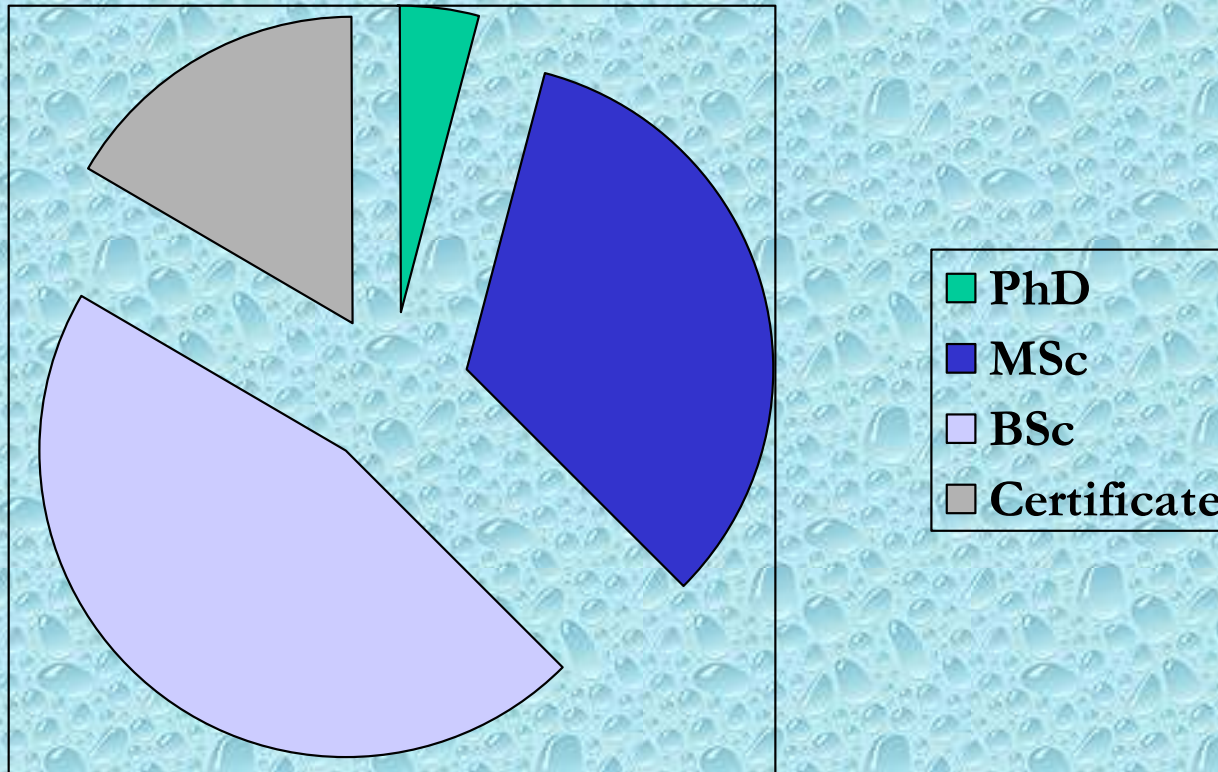
– **Research Institutes- gov/university-BCA, CARS**

– **Training Institutions-UNIMA, NRC**

Selected Actors In The Maize ASTI System/Sub-sector in Malawi

- **Advocacy groups** -lobbying and awareness-
CISANET
- **Private sector: marketing, input supply-**
Seed, Chemicals, Fertiliser, Equipment...
- **Media** – awareness creation/diffusion
- **Farmer associations** - lobbying, marketing
- **Credit institutions**

Qualifications of Actors in the maize Sub-sector



ACTOR FUNCTION MATRIX IN THE MAIZE SUBSECTOR IN MALAWI

Actor/Function	1	2	3	4	5	6	7	8	9	10
LEGISLATURE.	X	X	X				X	X	X	
DEPT A. RES. SER.			X			X	X			
DEPT. AG. EXT			X			X	X	X		
NRCM			X		X					X
UNIVERSITY OF MALAWI	X			X	X	X	X			X

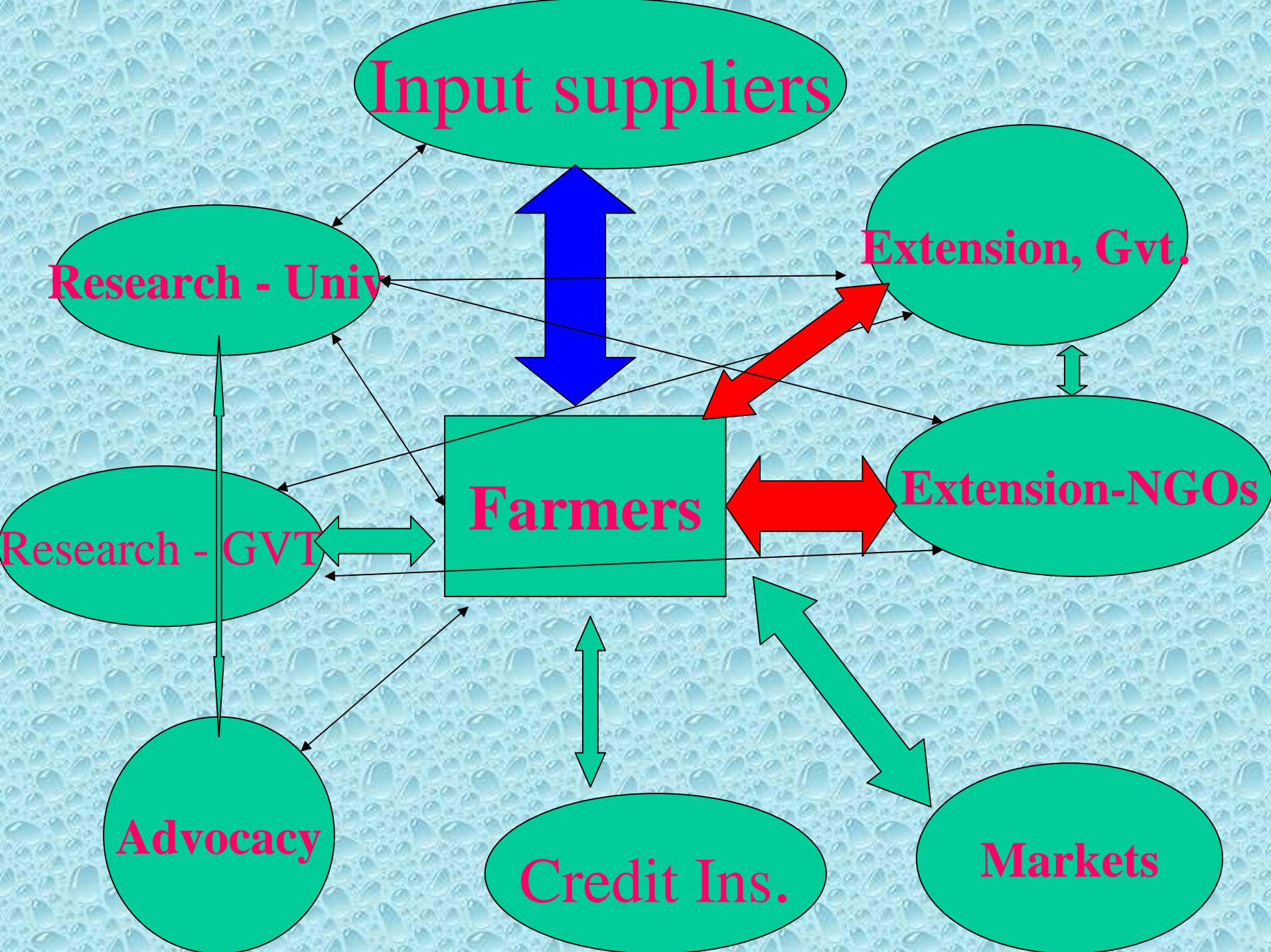
1. POLICY
2. REGULATION
3. FINANCING
4. RESEARCH/EXTENSION
5. RESOURCE FOR INNOVATION
6. CREATION OF TECH KNOWLEDGE
7. EX. OF INFORMATION
8. ARTICULATE DEMAND
9. CREATE MARKETS
10. ADVOCACY

ACTOR FUNCTION MATRIX IN THE MAIZE SUBSECTOR IN MALAWI

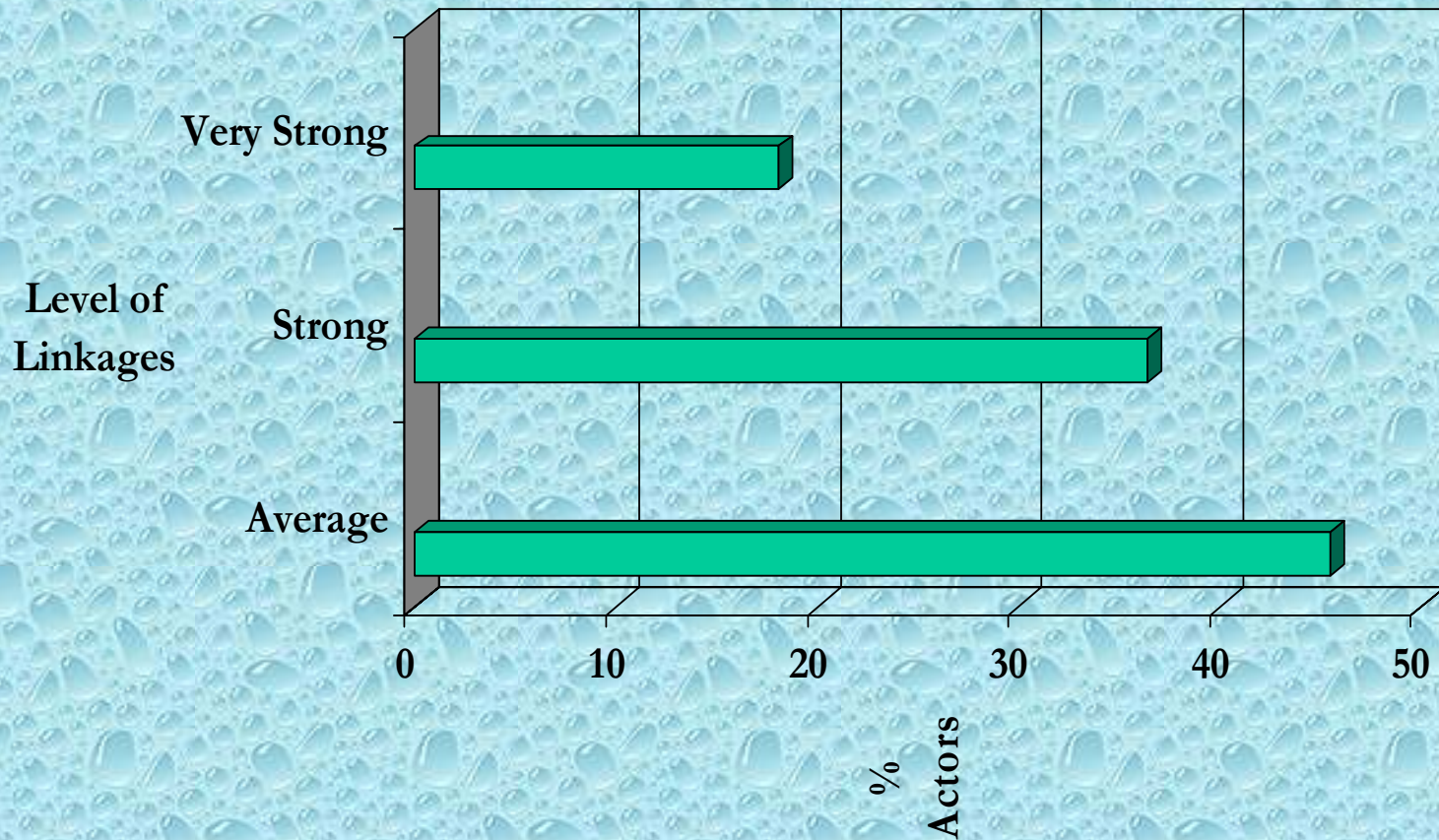
ACTOR/FUNCTION	1	2	3	4	5	6	7	8	9	10
CISANET				X			X	X		X
ADMARC							X	X	X	
CAMA	X							X		X
SEED SUPPLIERS			X	X	X	X			X	X
RAB PROCESSORS						X			X	

1. POLICY
2. REGULATION
3. FINANCING
4. RESEARCH/EXTENSION
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Linkages Among Actors



Overall Rating on Perception of Linkages Among Actors



Domestic Environment for Agriculture and the ASTI System (5=Strong; 1=Weak)

Govt. Incentives for Innovations in Agr	2.7
Scientific/Skilled manpower	2.6
Competence of Universities in Res. & Dev.	2.9
Number of Research Institutions	1.8
Intellectual Property Protection	1.6
Quality of ICT Services	1.7
Availability of Capital	1.6
Availability of Inputs	2.7

Domestic Environment cont'd

(5=Strong; 1=Weak)

State of Water Supply	1.5
State of Power Supply	2.0
Overall Domestic Environment for Agriculture	2.1

Examples of Innovations/Technologies adopted by farmers in the Maize Subsector

- **Hybrid and Open Pollinated Varieties-Quality Protein Maize**
- **Post Harvest Technology – Concrete Maize Granaries – Sasakawa Global 2000**
- **Use of Irrigation by s'holder farmers e.g. Treadle Pumps; canalisation (use of bamboos).**
- **Rain water harvesting**
- **Use of neem tree leaves as pesticide against maize weevils**

Examples of Innovations/Technologies adopted by farmers in the Maize Subsector

- **Contract Farming-seed maize**
- **Formation of farmer associations**
- **Marketing Information systems – e.g. use of cell phones – IDEAA; Malawi Commodity Exchange**
- **Establishment of Village/Community Food/Grain Banks – The Hunger Project**
- **Farmer Field Schools**
- **‘Money for Inputs’**
- **Pluralistic extension approach**
- **Land distribution to the landless**

PRIORITY RESEARCH AREAS IN THE MAIZE SUBSECTOR

- **Post harvest handling technologies**
- **Development of varieties resistant to pests and diseases e.g. Striga**
- **Labour saving technologies**
- **Factors affecting accessibility and adoption of technologies in the maize sub-sector**
- **Effects of policies on the maize sub-sector – e.g. marketing and prices of maize; R and D on STI.**

Some Challenges of the Maize ASTI System

- **Policy Issues: Not conducive for all actors**
(some are politically driven – sustainable?)
- **Inadequate funding for Research and Development**
 - e.g. Dept. of Agric. Res budget for 2006/07=MK166m~\$1.2m;
 - Department of Science and Technology =MK75m~\$535,714

Challenges (cont'd)

- **Inadequate capacity in R&D, Science and extension DARS: 2 Maize breeders, 1 Agronomist; 1 Entomologist; (45% vacancy rate in the Cereal Commodity Group);**
 - **Reliance on externally developed technologies**
- **Poor information flow/linkages among actors**
- **Institutional constraints-** lack of land; credit, markets, lack of research facilities

Challenges (cont'd)

- **Poor accessibility to inputs and unreliability of markets – liberalization; poor infrastructure**
- **High cost of inputs**
- **Inequitable land distribution or small landholding size**
- **Climatic change – droughts, floods..**

Strengths/opportunities for the ASTI System Approach in Malawi

- **Govt.'s will to have appropriate policies in place**
- **Existence of 'some' capacity in R and D**
- **Some Malawians introduced to the ASTI/NIS Approach.**
- **Donor support— e.g. Inception of the Bunda based Agriculture Research Development Programme (ARDEP) to fund research and outreach activities funded by NORAD**
- **Political will: Establishment of a University of Science and Technology (in the pipeline)**

Key Lessons Learned

- The Maize ASTI system is comprised of several actors (stakeholders) hence multisectoral
- **Actors perform can perform more than one function in an ASTI system**
- Not many people aware of the ASTI – holistic approach/system/concept
- **Poor linkages between/among actors in the maize sub sector in Malawi leading to poor information flow>>implications on research, development and adoption of innovations**

Key Lessons Learned cont'd

- There is need to involve all actors in developing research agendas and agricultural policies
- **The maize sub sector is embroiled in several problems that need concerted efforts to tackle**
- The current setup/environment (human and institutional - infrastructural capacity) is not very conducive for an effective ASTI system in the maize sub sector
- The ASTI methodological framework can be applied on any commodity



Strengthening the ASTI System: Way Forward

POLICIES

- **Government should create an enabling environment to integrate the National Innovation System Approach to Development**
- **Review approach policy development-how do we come up with policies? Are our policies working? Technical vs. Political**
- **Need for a participatory policy development and review to engage all actors.**

Linkages among actors

- **Regular joint consultative meetings/fora for actors**
 - **Joint collaborative research**
 - **Dissemination conferences**
 - **Policy making for a**
- **Create Innovative platforms accessible to all actors -email, e-newsletters...**

Capacity Building

- **Train more specialists in Science and Technology, NIS, R and D.**
- **Increase funding allocations and improve research facilities – reduce dependence on external funding**
- **Provide proper incentives to promote appreciation of science and technology**
- **Strengthen agricultural extension system**
- **Include NIS approach in education curriculum at secondary? Tertiary level.**

Research

- **Advocate a Client Oriented Research Management Approach – both Reactive and Proactive! E.g. the ARDEP at Bunda College.**
- **Advocate Participatory Technology Development**
- **Encourage involvement of the private sector to support R and D**
- **Recognise farmers' ability to innovate –adopt, adapt or refine indigenous knowledge**

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